

PENDING CLAIMS

1. (Previously Presented) An apparatus for performing multiple deposition processes, comprising:
 - a chamber body;
 - a lid assembly attached to the chamber body;
 - a first gas delivery sub-assembly coupled to the lid assembly and configured for a cyclical layer deposition process, comprising:
 - a gas conduit positioned on and extending through the lid assembly and having an expanding channel in fluid communication with the chamber body;
 - a first gas inlet and a second gas inlet positioned on the gas conduit to form a circular gas flow pattern within the gas conduit; and
 - a first high speed actuating valve coupled to the first gas inlet, a second high speed actuating valve coupled to the second gas inlet and the first and second high speed actuating valves are configured to sequentially pulse a first gas and a second gas during the cyclical layer deposition process; and
 - a second gas delivery sub-assembly coupled to the lid assembly and configured for a chemical vapor deposition process, comprising:
 - an annular mixing channel in fluid communication with the gas conduit and adapted to deliver a continuous flow of one or more compounds into the gas conduit during the chemical vapor deposition process.
2. (Original) The apparatus of claim 1, wherein the gas conduit comprises a gradually increasing inner diameter.
3. (Original) The apparatus of claim 1, wherein the gas conduit has a frusto-conical shape.
4. (Previously Presented) The apparatus of claim 1, wherein the annular mixing channel is in fluid communication with the gas conduit via one or more passageways.

5-6. (Cancelled)

7. (Previously Presented) An apparatus for performing multiple deposition processes, comprising:

- a chamber body;

- a lid assembly attached to the chamber body;

- a first gas delivery sub-assembly coupled to the lid assembly and configured for a cyclical layer deposition process, comprising:

 - a gas conduit in fluid communication with the chamber body positioned on and extending through the lid assembly;

 - at least two flow paths in fluid communication with the gas conduit, wherein each flow path is coupled to one or more high speed actuating valves for enabling the cyclical layer deposition process; and

- a second gas delivery sub-assembly coupled to the lid assembly and configured for a chemical vapor deposition process, comprising:

 - an annular mixing channel concentrically disposed about the gas conduit and in fluid communication with the gas conduit via one or more passageways;

 - at least one nozzle connected to each of the one or more passageways and positioned to eject a gas into the gas conduit; and

 - a first gas inlet positioned on an inner wall of the annular mixing channel to form a circular gas flow pattern for the gas within the annular mixing channel.

8. (Previously Presented) The apparatus of claim 7, wherein the gas conduit further comprises a conical concave lower surface to help evenly distribute gases within the chamber body.

9-10. (Cancelled)

11. (Previously Presented) The apparatus of claim 8, wherein the at least one nozzle is radially positioned or substantially radially positioned in relation to the gas conduit.

12. (Previously Presented) The apparatus of claim 8, wherein the at least one nozzle is tangentially positioned or substantially tangentially positioned in relation to the gas conduit.

13. (Previously Presented) The apparatus of claim 7, further comprising a second gas inlet positioned on an inner wall of the annular mixing channel.

14. (Cancelled)

15. (Previously Presented) The apparatus of claim 7, wherein the gas conduit comprises a gradually increasing inner diameter towards the chamber body.

16-20. (Cancelled)

21. (Previously Presented) The apparatus of claim 1, wherein the circular gas flow pattern is selected from the group consisting of a vortex pattern, a spiral pattern and a derivative thereof.

22. (Previously Presented) The apparatus of claim 13, wherein the second gas inlet is positioned with the first gas inlet to form the circular gas flow pattern.

23. (Previously Presented) The apparatus of claim 22, wherein the circular gas flow pattern is selected from the group consisting of a vortex pattern, a spiral pattern and a derivative thereof.

24. (Previously Presented) An apparatus for performing multiple deposition processes, comprising:

a substrate support having a substrate receiving surface and contained within a chamber body;

a lid assembly attached to the chamber body;

a process gas channel contained within a gas conduit positioned on and extending through the lid assembly and having an expanding channel in fluid communication with the substrate support;

a first gas delivery sub-assembly coupled to the lid assembly and configured for a cyclical layer deposition process, comprising:

a first gas inlet and a second gas inlet positioned on the gas conduit to form a circular gas flow pattern within the process gas channel; and

a first high speed actuating valve coupled to the first gas inlet, a second high speed actuating valve coupled to the second gas inlet and the first and second high speed actuating valves are configured to enable sequential pulses of gases with a pulse time of about 1 second or less during the cyclical layer deposition process; and

a second gas delivery sub-assembly coupled to the lid assembly and configured for a chemical vapor deposition process, comprising:

an annular mixing channel in fluid communication with the substrate support and adapted to deliver a continuous flow of one or more compounds into the process gas channel during the chemical vapor deposition process.

25. (Previously Presented) The apparatus of claim 24, wherein the pulse time is about 0.1 seconds or less.

26. (Previously Presented) The apparatus of claim 25, wherein the circular gas flow pattern is selected from the group consisting of a vortex pattern, a spiral pattern and a derivative thereof.

27. (Previously Presented) The apparatus of claim 24, wherein the annular mixing channel is in fluid communication with the gas conduit by a plurality of passageways formed through a surface of the gas conduit.

28. (Previously Presented) The apparatus of claim 27, wherein each passageway of the plurality of passageways contains a nozzle positioned to eject the one or more compounds into the process gas channel.

29. (Previously Presented) The apparatus of claim 28, wherein the nozzle is radially positioned or substantially radially positioned in relation to the gas conduit.

30. (Previously Presented) The apparatus of claim 28, wherein the nozzle is tangentially positioned or substantially tangentially positioned in relation to the gas conduit.